In the Claims:

1. (Original) A method for continuously separating polymer from a high pressure fluid stream, said method comprising:

subjecting the high pressure fluid stream including polymer particles to a filter, wherein the filter segregates the high pressure fluid stream from the polymer particles;

subjecting the polymer particles to a rotating device which transports the polymer particles away from the filter, wherein the polymer particles are exposed to thermal conditions sufficient to melt the polymer particles and form a seal surrounding at least a portion of the rotating device; and

separating the molten polymer from the rotating device;

wherein the method is carried out such that the separation of polymer from the high pressure fluid stream occurs under steady-state.

2. (Original) The method according to Claim 1, wherein the high pressure fluid stream comprises liquid carbon dioxide.

3. (Original) The method according to Claim 1, wherein the high pressure fluid stream comprises supercritical carbon dioxide.

4. (Original) The method according to Claim 1, wherein the high pressure fluid stream comprises gaseous carbon dioxide.

5. (Original) The method according to Claim 1, wherein the high pressure fluid stream further comprises one or more monomers.

6. (Original) The method according to Claim 1, wherein the polymer particles

comprise at least one polymer selected from the group consisting of a homopolymer, a copolymer, a plurality of homopolymers, a plurality of copolymers, one or more homopolymers and one or more copolymers, and mixtures thereof.

7. (Original) The method according to Claim 1, wherein the polymer particles comprise a polymer formed from a reaction selected from the group consisting of precipitation, microemulsion, emulsion, suspension, and dispersion polymerization reactions.

8. (Original) The method according to Claim 5, wherein the monomer is a vinyl monomer.

9. (Original) The method according to Claim 8, wherein the vinyl monomer is selected from the group consisting of an aromatic vinyl monomer, a conjugated diene monomer, an unsaturated acid monomer, a nitrogen-containing monomer, a non-aromatic unsaturated monocarboxylic ester monomer, and mixtures thereof.

10. (Original) The method according to Claim 5, wherein the monomer is a fluorinated monomer.

11. (Original) The method according to Claim 10, wherein the fluorinated monomer is selected from the group consisting of a fluoroacrylate monomer, a fluorostyrene monomer, a fluoroalkylene oxide monomer, a fluoroolefin monomer, and mixtures thereof.

12. (Original) The method according to Claim 5, wherein the monomer is vinylidene fluoride.

13. (Original) The method according to Claim 5, wherein the high pressure fluid stream further comprises one or more initiators.

14. (Original) The method according to Claim 13, wherein the initiator is a free radical initiator.

15. (Original) The method according to Claim 14, wherein the initiator is selected from the group consisting of acetylcyclohexanesulfonyl peroxide; diacetyl peroxydicarbonate; diethyl peroxydicarbonate; dicyclohexyl peroxydicarbonate; di-2-ethylhexyl peroxydicarbonate; tert-butyl perneodecanoate; 2,2′-azobis(methoxy-2,4-dimethylvaleronitrile); tert-butyl perpivalate; dioctanoyl peroxide; dilauroyl peroxide; 2,2′-azobis(2,4-dimethylvaleronitrile); tert-butylazo-2-cyanobutane; dibenzoyl peroxide; tert-butyl per-2-ethylhexanoate; tert-butyl permaleate; 2,2-azobis(isobutyronitrile); bis(tert-butylperoxy) cyclohexane; tert-butyl peroxyisopropylcarbonate; tert-butyl peracetate; 2,2-bis(tert-butylperoxy) butane; dicumyl peroxide; di-tert-amyl peroxide; di-tert-butyl peroxide; p-methane hydroperoxide; pinane hydroperoxide; cumene hydroperoxide; tert-butyl hydroperoxide; di-isopropyl peroxydicarbonate, di-sec-butyl peroxydicarbonate, and mixtures thereof.

16. (Original) The method according to Claim 1, wherein the high pressure fluid stream has pressure ranging from about 1000 to about 5000 psi, and wherein said step of subjecting the high pressure fluid stream comprising the polymer particles to a filter comprises separating the high pressure fluid stream such that it is present at the high pressure as it separates from the polymer particles.

17. (Original) The method according to Claim 1, wherein said step of subjecting the polymer particles to a rotation device is carried out at a temperature ranging from about 20 °C to about 350 °C.

18. (Original) The method according to Claim 1, wherein said step of subjecting the polymer particles to a rotating device is carried out in an extruder.

19. (Original) The method according to Claim 18, wherein said step of separating the molten polymer from the rotating device comprises discharging the molten polymer from the extruder at a pressure ranging from about 0 to about 50 psi above ambient pressure.

20. (Original) The method according to Claim 1, wherein the polymer particles are formed as a result of a continuous polymerization method in fluid communication with the method for continuously separating the polymer particles from the carbon dioxide fluid stream.

21. (Original) The method according to Claim 20, wherein the continuous polymerization method comprises employing two or more reactors in series.

22. (Original) A method for continuously separating polymer from a high pressure fluid stream comprising gaseous, liquid or supercritical, said method comprising:

subjecting the high pressure fluid stream including polymer particles to a filter, wherein the filter segregates the high pressure fluid stream from the polymer particles, the polymer particles comprising a fluorinated polymer;

subjecting the polymer particles to a rotating device which transports the polymer particles away from the high pressure fluid stream, wherein the polymer particles are exposed to thermal conditions sufficient to melt the polymer particles and form a seal surrounding at least a portion of the rotating device; and

separating the molten polymer from the rotating device;

wherein the method is carried out such that the separation of polymer from the high pressure fluid stream occurs under steady-state.

23. (Withdrawn) An apparatus for continuously separating polymer from a high pressure fluid stream, said apparatus comprising:

a filter for segregating polymer particles from the high pressure fluid stream;

an inlet in communication to said filter to introduce the polymer particles and the high pressure fluid stream thereto;

a first outlet connected to said filter for withdrawing the high pressure fluid stream therefrom;

a rotating device in communication with the filter for withdrawing the polymer particles from the filter;

a heater in communication with the rotating device to melt the polymer paticles such that a melt seal is formed around at least a portion of the rotating device; and

a second outlet in communication with said rotating device for withdrawing molten polymer therefrom;

wherein said apparatus is configured such that the separation of polymer from the high pressure fluid stream occurs under steady-state.

24. (Withdrawn) The apparatus according to Claim 23, wherein the filter comprises a shaft having a plurality of blades connected to the shaft and extending therefrom.

25. (Withdrawn) The apparatus according to Claim 23, further comprising a first housing that contains said filter.

26. (Withdrawn) The apparatus according to Claim 25, wherein said rotating device is present in the form of a single screw comprising a shaft, and wherein the shaft of the single screw is connected to the shaft present in said filter.

27. (Withdrawn) The apparatus according to Claim 26, further comprising a drive motor in communication with the shaft of the single screw to cause rotation of the shaft of the single screw and the shaft present in the filter.

28. (Withdrawn) The apparatus according to Claim 25, further comprising a second housing surrounding said rotating device, and wherein the second housing is connected to the first housing.

29. (Withdrawn) The apparatus according to Claim 28, wherein the heater surrounds the second housing.

30. (Withdrawn) The apparatus according to Claim 23, further comprising a third outlet in fluid communication with the rotating device to withdraw at least a portion of the high pressure fluid stream not removed in said first outlet.

31. (Withdrawn) The apparatus according to Claim 30, wherein the third outlet is present in the form of a rotary screw or stuffer.

32. (Withdrawn) The apparatus according to Claim 23, wherein the apparatus for continuously separating polymer particles from a high pressure fluid stream is in communication with an apparatus for the continuous polymerization of a monomer in carbon dioxide.

33. (Withdrawn) The apparatus according to Claim 23, wherein the filter for segregating polymer particles from the high pressure fluid stream comprises twin shafts having a plurality of blades connected to the shafts and extending therefrom.

34. (Withdrawn) The apparatus according to Claim 33, wherein the rotating device in communication with the filter for withdrawing the polymer particles from the filter comprises twin shafts each connected to the shafts of said filter.